



102286-413.ST25

SEQUENCE LISTING

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Gao, George Fu
Gerth, Ulrich Conrad
Sewell, Andrew Kelvin

<120> CD8 AS AN INHIBITOR OF THE CELLULAR IMMUNE SYSTEM

<130> 102286.413

<140> US 09/560,494

<141> 2000-04-28

<150> PCT/GB98/03235

<151> 1998-10-28

<150> GB 9722779.7

<151> 1997-10-28

<160> 32

<170> FastSEQ for Windows Version 4.0

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<211> 48

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

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gactgagtcg cggccgctgc caccatggcc ttaccagtga ccgccttg

48

<210> 2

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 2

tattcgactg gaccttata cgtatctcgc cgaaaggctg gg

42

<210> 3

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 3

ggaattccat atgagccagt tccgggtgtc gccgctggat cg

42

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<211> 54
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<220>
 <223> Synthetic DNA primer

<400> 4
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<210> 5
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 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic DNA primer

<400> 5
 caccgcgaat tcggatccta agcgggtcta caagcttcgg gcttcgctgg caggaagacc 60

<210> 6
 <211> 59
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic DNA primer

<400> 6
 caccgcgaat tcggatccta agcgggtcta caagcttctg gcgtcgtggg gggcttcgc 59

<210> 7
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic DNA primer

<400> 7
 caccgcgaat tcggatccta agcgggtcta caagcttcgg gcttcgctgg caggaagacc 60

<210> 8
 <211> 42
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic DNA primer

<400> 8
 gtggcaagct tggatcctat ggcgtcgtgg tgggcttcgc tg 42

<210> 9
 <211> 42
 <212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 9

ggaattccat atgagtcaat ttcgtgtatc accgctggat cg

42

<210> 10

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 10

acatacccat gggctctcac tccatgaggt atttc

35

<210> 11

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 11

acatacaagc ttacggctcc catcttaagg tgaggggctt ggg

43

<210> 12

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> HLA-A2 Pol-restricted CTL line specific peptide

<400> 12

Ile Leu Lys Glu Pro Val His Gly Val

1

5

<210> 13

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> HLA-A2 Pol-restricted CTL line specific peptide

<400> 13

Ser Leu Tyr Asn Thr Val Ala Thr Leu

1

5

<210> 14

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> HLA-A2 Pol-restricted CTL line specific peptide

<400> 14

Val Ile Tyr Gln Tyr Met Asp Asp Leu
1 5

<210> 15

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 15

ctgtccaacc cgacgtcggg cagctcgtgg ctcttccagc cg 42

<210> 16

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 16

cggctggaag agccacgagc tgcccgcacgt cgggttggac ag 42

<210> 17

<211> 99

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA primer

<400> 17

gggggaagct taatgccatt cgattttctg agcttcaaaa atatcgttca gaccaccacc 60
ggatcctggc gtcgtggtgg gcttcgctgg caggaagac 99

<210> 18

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> CD8 alpha polypeptide

<400> 18

Gly Ser Gly Gly Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu
1 5 10 15
Trp His

<210> 19
 <211> 63
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic DNA primer

<400> 19
 gaggaggagc atatgaaacc acaagcacct gaactacgaa tctttccaaa gaaaatggac 60
 gcc 63

<210> 20
 <211> 36
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic DNA primer

<400> 20
 ggggagggaa gcttacttgg tagtagtaga gttcac 36

<210> 21
 <211> 9
 <212> PRT
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<220>
 <223> HLA-A2-flu

<400> 21
 Gly Ile Leu Gly Phe Val Phe Thr Leu
 1 5

<210> 22
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> peptide epitope

<400> 22
 Lys Ala Val Tyr Asn Phe Ala Thr Cys
 1 5

<210> 23
 <211> 366
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic DNA construct encoding part of the
 extracellular domain of human CD8 alpha

<221> CDS

<222> (1) ... (366)

<400> 23

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Met Ser Gln Phe Arg Val Ser Pro Leu Asp Arg Thr Trp Asn Leu Gly	
1 5 10 15	
gag aca gtg gag ctg aag tgc cag gtg ctg ctg tcc aac ccg acg tcg	96
Glu Thr Val Glu Leu Lys Cys Gln Val Leu Leu Ser Asn Pro Thr Ser	
20 25 30	
ggc tgc tcg tgg ctc ttc cag ccg cgc ggc gcc gcc gcc agt ccc acc	144
Gly Cys Ser Trp Leu Phe Gln Pro Arg Gly Ala Ala Ala Ser Pro Thr	
35 40 45	
ttc ctc cta tac ctc tcc caa aac aag ccc aag gcg gcc gag ggg ctg	192
Phe Leu Leu Tyr Leu Ser Gln Asn Lys Pro Lys Ala Ala Glu Gly Leu	
50 55 60	
gac acc cag cgg ttc tcg ggc aag agg ttg ggg gac acc ttc gtc ctc	240
Asp Thr Gln Arg Phe Ser Gly Lys Arg Leu Gly Asp Thr Phe Val Leu	
65 70 75 80	
acc ctg agc gac ttc cgc cga gag aac gag ggc tac tat ttc tgc tcg	288
Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr Tyr Phe Cys Ser	
85 90 95	
gcc ctg agc aac tcc atc atg tac ttc agc cac ttc gtg ccg gtc ttc	336
Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe Val Pro Val Phe	
100 105 110	
ctg cca gcg aag ccc acc acg acg cca tag	366
Leu Pro Ala Lys Pro Thr Thr Thr Pro *	
115 120	

<210> 24

<211> 121

<212> PRT

<213> Artificial Sequence

<220>

<223> an amino acid construct encoding part of the
extracellular domain of human CD8 alpha

<400> 24

Met Ser Gln Phe Arg Val Ser Pro Leu Asp Arg Thr Trp Asn Leu Gly	
1 5 10 15	
Glu Thr Val Glu Leu Lys Cys Gln Val Leu Leu Ser Asn Pro Thr Ser	
20 25 30	
Gly Cys Ser Trp Leu Phe Gln Pro Arg Gly Ala Ala Ala Ser Pro Thr	
35 40 45	
Phe Leu Leu Tyr Leu Ser Gln Asn Lys Pro Lys Ala Ala Glu Gly Leu	
50 55 60	
Asp Thr Gln Arg Phe Ser Gly Lys Arg Leu Gly Asp Thr Phe Val Leu	
65 70 75 80	
Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr Tyr Phe Cys Ser	
85 90 95	
Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe Val Pro Val Phe	

100 105 110
 Leu Pro Ala Lys Pro Thr Thr Thr Pro
 115 120

<210> 25
 <211> 400
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> a synthetic DNA construct encoding part of the
 extracellular domain of murine CD8 alpha

<221> CDS
 <222> (4)...(396)

<400> 25
 cat atg aaa cca caa gca cct gaa cta cga atc ttt cca aag aaa atg 48
 Met Lys Pro Gln Ala Pro Glu Leu Arg Ile Phe Pro Lys Lys Met
 1 5 10 15
 gac gcc gaa ctt ggt cag aag gtg gac ctg gta tgt gaa gtg ttg ggg 96
 Asp Ala Glu Leu Gly Gln Lys Val Asp Leu Val Cys Glu Val Leu Gly
 20 25 30
 tcc gtt tcg caa gga tgc tct tgg ctc ttc cag aac tcc agc tcc aaa 144
 Ser Val Ser Gln Gly Cys Ser Trp Leu Phe Gln Asn Ser Ser Ser Lys
 35 40 45
 ctc ccc cag ccc acc ttc gtt gtc tat atg gct tca tcc cac aac aag 192
 Leu Pro Gln Pro Thr Phe Val Val Tyr Met Ala Ser Ser His Asn Lys
 50 55 60
 ata acg tgg gac gag aag ctg aat tcg tcg aaa ctg ttt tct gcc atg 240
 Ile Thr Trp Asp Glu Lys Leu Asn Ser Ser Lys Leu Phe Ser Ala Met
 65 70 75
 agg gac acg aat aat aag tac gtt ctc acc ctg aac aag ttc agc aag 288
 Arg Asp Thr Asn Asn Lys Tyr Val Leu Thr Leu Asn Lys Phe Ser Lys
 80 85 90 95
 gaa aac gaa ggc tac tat ttc tgc tca gtc atc agc aac tcg gtg atg 336
 Glu Asn Glu Gly Tyr Tyr Phe Cys Ser Val Ile Ser Asn Ser Val Met
 100 105 110
 tac ttc agt tct gtc gtg cca gtc ctt cag aaa gtg aac tct act act 384
 Tyr Phe Ser Ser Val Val Pro Val Leu Gln Lys Val Asn Ser Thr Thr
 115 120 125
 acc aag cca taa gctt 400
 Thr Lys Pro *
 130

<210> 26
 <211> 130
 <212> PRT
 <213> Artificial Sequence

<220>

<223> an amino acid construct encoding part of the
extracelular domain of murine CD8 alpha

<400> 26

Met	Lys	Pro	Gln	Ala	Pro	Glu	Leu	Arg	Ile	Phe	Pro	Lys	Lys	Met	Asp
1				5					10					15	
Ala	Glu	Leu	Gly	Gln	Lys	Val	Asp	Leu	Val	Cys	Glu	Val	Leu	Gly	Ser
		20						25					30		
Val	Ser	Gln	Gly	Cys	Ser	Trp	Leu	Phe	Gln	Asn	Ser	Ser	Ser	Lys	Leu
		35					40					45			
Pro	Gln	Pro	Thr	Phe	Val	Val	Tyr	Met	Ala	Ser	Ser	His	Asn	Lys	Ile
	50					55					60				
Thr	Trp	Asp	Glu	Lys	Leu	Asn	Ser	Ser	Lys	Leu	Phe	Ser	Ala	Met	Arg
65					70					75				80	
Asp	Thr	Asn	Asn	Lys	Tyr	Val	Leu	Thr	Leu	Asn	Lys	Phe	Ser	Lys	Glu
			85						90					95	
Asn	Glu	Gly	Tyr	Tyr	Phe	Cys	Ser	Val	Ile	Ser	Asn	Ser	Val	Met	Tyr
		100						105					110		
Phe	Ser	Ser	Val	Val	Pro	Val	Leu	Gln	Lys	Val	Asn	Ser	Thr	Thr	Thr
		115					120					125			
Lys	Pro														
	130														

<210> 27

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> CD8 protein

<400> 27

Leu	Leu	Leu	His	Ala	Ala	Arg	Pro
1				5			

<210> 28

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> CD8 protein

<400> 28

Ala	Pro	Arg	Pro	Pro	Thr	Pro	Ala
1				5			

<210> 29

<211> 708

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(708)

<223> Human CD8 alpha

<221> CDS

<222> (1)...(708)

<400> 29

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Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu	
1 5 10 15	
cac gcc gcc agg ccg agc cag ttc cgg gtg tcg ccg ctg gat cgg acc	96
His Ala Ala Arg Pro Ser Gln Phe Arg Val Ser Pro Leu Asp Arg Thr	
20 25 30	
tgg aac ctg ggc gag aca gtg gag ctg aag tgc cag gtg ctg ctg tcc	144
Trp Asn Leu Gly Glu Thr Val Glu Leu Lys Cys Gln Val Leu Leu Ser	
35 40 45	
aac ccg acg tcg ggc tgc tcg tgg ctc ttc cag ccg cgc ggc gcc gcc	192
Asn Pro Thr Ser Gly Cys Ser Trp Leu Phe Gln Pro Arg Gly Ala Ala	
50 55 60	
gcc agt ccc acc ttc ctc cta tac ctc tcc caa aac aag ccc aag gcg	240
Ala Ser Pro Thr Phe Leu Leu Tyr Leu Ser Gln Asn Lys Pro Lys Ala	
65 70 75 80	
gcc gag ggg ctg gac acc cag cgg ttc tcg ggc aag agg ttg ggg gac	288
Ala Glu Gly Leu Asp Thr Gln Arg Phe Ser Gly Lys Arg Leu Gly Asp	
85 90 95	
acc ttc gtc ctc acc ctg agc gac ttc cgc cga gag aac gag ggc tac	336
Thr Phe Val Leu Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr	
100 105 110	
tat ttc tgc tcg gcc ctg agc aac tcc atc atg tac ttc agc cac ttc	384
Tyr Phe Cys Ser Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe	
115 120 125	
gtg ccg gtc ttc ctg cca gcg aag ccc acc acg acg cca gcg ccg cga	432
Val Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg	
130 135 140	
cca cca aca ccg gcg ccc acc atc gcg tcg cag ccc ctg tcc ctg cgc	480
Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg	
145 150 155 160	
cca gag gcg tgc cgg cca gcg gcg ggg ggc gca gtg cac acg agg ggg	528
Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly	
165 170 175	
ctg gac ttc gcc tgt gat atc tac atc tgg gcg ccc ttg gcc ggg act	576
Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr	
180 185 190	
tgt ggg gtc ctt ctc ctg tca ctg gtt atc acc ctt tac tgc aac cac	624
Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His	
195 200 205	
agg aac cga aga cgt gtt tgc aaa tgt ccc ccg cct gtg gtc aaa tcg	672
Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val Lys Ser	
210 215 220	

gga gac aag ccc agc ctt tcg gcg aga tac gtc taa
 Gly Asp Lys Pro Ser Leu Ser Ala Arg Tyr Val *
 225 230 235

708

<210> 30
 <211> 235
 <212> PRT
 <213> Homo sapien

<400> 30
 Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
 1 5 10 15
 His Ala Ala Arg Pro Ser Gln Phe Arg Val Ser Pro Leu Asp Arg Thr
 20 25 30
 Trp Asn Leu Gly Glu Thr Val Glu Leu Lys Cys Gln Val Leu Leu Ser
 35 40 45
 Asn Pro Thr Ser Gly Cys Ser Trp Leu Phe Gln Pro Arg Gly Ala Ala
 50 55 60
 Ala Ser Pro Thr Phe Leu Leu Tyr Leu Ser Gln Asn Lys Pro Lys Ala
 65 70 75 80
 Ala Glu Gly Leu Asp Thr Gln Arg Phe Ser Gly Lys Arg Leu Gly Asp
 85 90 95
 Thr Phe Val Leu Thr Leu Ser Asp Phe Arg Arg Glu Asn Glu Gly Tyr
 100 105 110
 Tyr Phe Cys Ser Ala Leu Ser Asn Ser Ile Met Tyr Phe Ser His Phe
 115 120 125
 Val Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg
 130 135 140
 Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg
 145 150 155 160
 Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly
 165 170 175
 Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr
 180 185 190
 Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His
 195 200 205
 Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val Lys Ser
 210 215 220
 Gly Asp Lys Pro Ser Leu Ser Ala Arg Tyr Val
 225 230 235

<210> 31
 <211> 744
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Murine CD8 alpha

<221> CDS
 <222> (1)...(744)

<400> 31
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 Met Ala Ser Pro Leu Thr Arg Phe Leu Ser Leu Asn Leu Leu Leu Leu
 1 5 10 15

48

ggt	gag	tcg	att	atc	ctg	ggg	agt	gga	gaa	gct	aag	cca	cag	gca	ccc	96
Gly	Glu	Ser	Ile	Ile	Leu	Gly	Ser	Gly	Glu	Ala	Lys	Pro	Gln	Ala	Pro	
			20					25					30			
gaa	ctc	cga	atc	ttt	cca	aag	aaa	atg	gac	gcc	gaa	ctt	ggt	cag	aag	144
Glu	Leu	Arg	Ile	Phe	Pro	Lys	Lys	Met	Asp	Ala	Glu	Leu	Gly	Gln	Lys	
		35					40					45				
gtg	gac	ctg	gta	tgt	gaa	gtg	ttg	ggg	tcc	ggt	tcg	caa	gga	tgc	tct	192
Val	Asp	Leu	Val	Cys	Glu	Val	Leu	Gly	Ser	Val	Ser	Gln	Gly	Cys	Ser	
	50					55					60					
tgg	ctc	ttc	cag	aac	tcc	agc	tcc	aaa	ctc	ccc	cag	ccc	acc	ttc	gtt	240
Trp	Leu	Phe	Gln	Asn	Ser	Ser	Ser	Lys	Leu	Pro	Gln	Pro	Thr	Phe	Val	
65					70					75					80	
gtc	tat	atg	gct	tca	tcc	cac	aac	aag	ata	acg	tgg	gac	gag	aag	ctg	288
Val	Tyr	Met	Ala	Ser	Ser	His	Asn	Lys	Ile	Thr	Trp	Asp	Glu	Lys	Leu	
				85					90					95		
aat	tcg	tcg	aaa	ctg	ttt	tct	gcc	atg	agg	gac	acg	aat	aat	aag	tac	336
Asn	Ser	Ser	Lys	Leu	Phe	Ser	Ala	Met	Arg	Asp	Thr	Asn	Asn	Lys	Tyr	
			100					105					110			
gtt	ctc	acc	ctg	aac	aag	ttc	agc	aag	gaa	aac	gaa	ggc	tac	tat	ttc	384
Val	Leu	Thr	Leu	Asn	Lys	Phe	Ser	Lys	Glu	Asn	Glu	Gly	Tyr	Tyr	Phe	
		115					120					125				
tgc	tca	gtc	atc	agc	aac	tcg	gtg	atg	tac	ttc	agt	tct	gtc	gtg	cca	432
Cys	Ser	Val	Ile	Ser	Asn	Ser	Val	Met	Tyr	Phe	Ser	Ser	Val	Val	Pro	
	130					135					140					
gtc	ctt	cag	aaa	gtg	aac	tct	act	act	acc	aag	cca	gtg	ctg	cga	act	480
Val	Leu	Gln	Lys	Val	Asn	Ser	Thr	Thr	Thr	Lys	Pro	Val	Leu	Arg	Thr	
145					150					155					160	
ccc	tca	cct	gtg	cac	cct	acc	ggg	aca	tct	cag	ccc	cag	aga	cca	gaa	528
Pro	Ser	Pro	Val	His	Pro	Thr	Gly	Thr	Ser	Gln	Pro	Gln	Arg	Pro	Glu	
				165					170					175		
gat	tgt	cgg	ccc	cgt	ggc	tca	gtg	aag	ggg	acc	gga	ttg	gac	ttc	gcc	576
Asp	Cys	Arg	Pro	Arg	Gly	Ser	Val	Lys	Gly	Thr	Gly	Leu	Asp	Phe	Ala	
			180					185					190			
tgt	gat	att	tac	atc	tgg	gca	ccc	ttg	gcc	gga	atc	tgc	gtg	gcc	ctt	624
Cys	Asp	Ile	Tyr	Ile	Trp	Ala	Pro	Leu	Ala	Gly	Ile	Cys	Val	Ala	Leu	
		195					200					205				
ctg	ctg	tcc	ttg	atc	atc	act	ctc	atc	tgc	tac	cac	agg	agc	cga	aag	672
Leu	Leu	Ser	Leu	Ile	Ile	Thr	Leu	Ile	Cys	Tyr	His	Arg	Ser	Arg	Lys	
	210					215					220					
cgt	gtt	tgc	aaa	tgt	ccc	agg	ccg	cta	gtc	aga	cag	gaa	ggc	aag	ccc	720
Arg	Val	Cys	Lys	Cys	Pro	Arg	Pro	Leu	Val	Arg	Gln	Glu	Gly	Lys	Pro	
225					230					235					240	
aga	cct	tca	gag	aaa	att	gtg	taa									744
Arg	Pro	Ser	Glu	Lys	Ile	Val	*									
				245												

<210> 32
 <211> 247
 <212> PRT
 <213> Artificial Sequence

<400> 32
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 Gly Glu Ser Ile Ile Leu Gly Ser Gly Glu Ala Lys Pro Gln Ala Pro
 20 25 30
 Glu Leu Arg Ile Phe Pro Lys Lys Met Asp Ala Glu Leu Gly Gln Lys
 35 40 45
 Val Asp Leu Val Cys Glu Val Leu Gly Ser Val Ser Gln Gly Cys Ser
 50 55 60
 Trp Leu Phe Gln Asn Ser Ser Ser Lys Leu Pro Gln Pro Thr Phe Val
 65 70 75 80
 Val Tyr Met Ala Ser Ser His Asn Lys Ile Thr Trp Asp Glu Lys Leu
 85 90 95
 Asn Ser Ser Lys Leu Phe Ser Ala Met Arg Asp Thr Asn Asn Lys Tyr
 100 105 110
 Val Leu Thr Leu Asn Lys Phe Ser Lys Glu Asn Glu Gly Tyr Tyr Phe
 115 120 125
 Cys Ser Val Ile Ser Asn Ser Val Met Tyr Phe Ser Ser Val Val Pro
 130 135 140
 Val Leu Gln Lys Val Asn Ser Thr Thr Thr Lys Pro Val Leu Arg Thr
 145 150 155 160
 Pro Ser Pro Val His Pro Thr Gly Thr Ser Gln Pro Gln Arg Pro Glu
 165 170 175
 Asp Cys Arg Pro Arg Gly Ser Val Lys Gly Thr Gly Leu Asp Phe Ala
 180 185 190
 Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Ile Cys Val Ala Leu
 195 200 205
 Leu Leu Ser Leu Ile Ile Thr Leu Ile Cys Tyr His Arg Ser Arg Lys
 210 215 220
 Arg Val Cys Lys Cys Pro Arg Pro Leu Val Arg Gln Glu Gly Lys Pro
 225 230 235 240
 Arg Pro Ser Glu Lys Ile Val
 245